

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A toothbrush head having a bristle surface from which a cluster of bristles extends in a bristle direction, the head ~~being suitable~~ comprising means to direct incident radiation toward a surface of a tooth and means to collect emitted radiation from the surface of the tooth, ~~characterised in that~~ wherein;

the means to direct incident radiation toward the surface of a tooth, ~~and/or~~ the means to collect emitted radiation from the surface of the tooth comprise one or more ~~cores~~ core within the toothbrush head ~~and~~ made of a first plastic material which is transparent to the incident ~~and/or~~ emitted radiation, and in which radiation transmitted internally within the core is guided by internal reflection within the core, the ~~core~~ first plastic material having a refractive index N^1 , and a sheath surrounding the core ~~being surrounded by a sheath and~~ comprising a monolithic body in which the bristles of the head are mounted, and which is ~~also~~ made of a second plastic material which is transparent to the incident ~~and/or~~ emitted radiation, the ~~sheath~~ second plastic material having a refractive index N^2 , N^1 being greater than N^2 , such that internal reflection occurs as a result of the difference in refractive index between N^1 and N^2 , and/or the core is surrounded by a sheath which is of a reflective material which reflects the incident and/or emitted radiation.

2. [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the first and second plastic [material] materials are ~~which is transparent to the incident and/or emitted radiation is transparent~~ over the wavelength range 400 – 630nm.

3. (Cancelled)

4. (Currently Amended) [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the reflective material is a metal.

5. (Currently Amended) [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the head of the toothbrush is made of a monolithic body of a

~~material which is transparent to the incident and/or emitted radiation and may thus guide radiation transmitted internally within it~~ the second plastic material and is coated ~~, either wholly or partially,~~ with a reflective coating.

6. (Cancelled)

7. (Currently Amended) [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the ~~core~~ first plastic material is a polymethylmethacrylate and the ~~sheath~~ second plastic material is polyethyleneterephthalate.

8. (Currently Amended) [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the core is a generally "L" shaped structure having a limb oriented in the generally longitudinal direction of the head and a limb oriented generally in the bristle direction and terminating in a surface which is substantially perpendicular to the bristle direction.

9. (Currently Amended) [[A]] The toothbrush head according to claim 8 ~~characterised in that~~ wherein the bend of the "L" between the limbs is curved or bevelled to present a surface at 45° to the limbs.

10. (Currently Amended) [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the cross-sectional dimension of the core is 5-95% of the cross sectional width and/or thickness of the head.

11. (Currently Amended) [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the core has a surface which is substantially perpendicular to the bristle direction, so that incident radiation passing along the core may emerge from the core through this surface and from thence be directed to the tooth surface and/or emitted radiation from the tooth surface may enter the core through this surface and may be directed through the core, and a layer of transparent head material is provided at this surface so that incident and emitted radiation passes through this transparent head material.

12. (Cancelled)

13. (Cancelled)

14. (Currently Amended) [[A]] The toothbrush head according to claim 1 ~~characterised in that~~ wherein the bristle surface is provided with one or more bristle free areas which function as windows for radiation passing to and from the tooth surface to the toothbrush head.

15. (Currently Amended) [[A]] The toothbrush head according to claim 1 characterised by having one or more lenses for radiation passing to and from the tooth surface to the toothbrush head which focus emitted radiation from the toothbrush head onto the tooth surface and/or which focus or collect emitted radiation from the tooth surface.

16. (Currently Amended) [[A]] The toothbrush having a head as claimed in claim 1.

17. (Currently Amended) An injection moulding process by which a toothbrush head as claimed in any one of the preceding claims is made, ~~characterised in that a~~ wherein the core is first made of the first plastic material, optionally a reflective metal layer is applied to this core, then the core is positioned in an injection mould cavity defining the shape of the monolithic body ~~of the toothbrush head~~, and then the monolithic body is formed of the first second plastic material around the core by an injection moulding process.